

**CLAIMS**

1. A polymer composition comprising a polymer resin, a flash calcined kaolin clay filler and a titanium dioxide filler, wherein the weight ratio of the flash calcined clay to the titanium dioxide in the composition is in the range of up to 10:1 and wherein the polymer resin is one which hardens or cures to a plastic material which has a refractive index of at least about 1.45.
2. A polymer composition according to claim 1, wherein the polymer resin is a polyolefin resin.
3. A polymer composition according to claim 2, wherein the polyolefin resin is a homopolymer of an ethene, propene or butene or a copolymer of ethane, propene, butene and another monomer.
4. A polymer composition according to claim 3, wherein the polyolefin resin is a polyethylene resin.
5. A polymer composition according to claim 4, wherein the polyethylene resin is selected from low density polyethylene, linear low-density polyethylene, middle-density polyethylene and high density polyethylene.
6. A polymer composition according to claim 5, wherein the polyethylene resin is selected from low-density polyethylene and linear low density polyethylene.
7. A polymer composition according to claim 1, wherein the polymer resin is a PVC resin.
8. A polymer composition according to any preceding claim, wherein the flash calcined clay has a specific gravity no greater than 2.4.
9. A polymer composition according to claim 8, wherein the flash calcined clay has a specific gravity no greater than 2.2.
10. A polymer composition according to any preceding claim, wherein the flash calcined clay has a

particle size distribution such that at least 50 weight % of the particles are smaller than 2 $\mu$ m.

11. A polymer composition according to claim 10, wherein the flash calcined clay has a particle size distribution such that between about 40 and 80 weight % of the particles are smaller than 2 $\mu$ m.

12. A polymer composition according to any preceding claim, wherein the flash calcined clay has a  $d_{50}$  in the range of from about 1.4 to 2.0 $\mu$ m.

13. A polymer composition according to claim 4, 5 or 6, wherein the flash calcined clay has a specific gravity of less than about 2.4, a particle size distribution such that between about 50 and 65 weight % of the particles are smaller than 2 $\mu$ m and a  $d_{50}$  in the range of from about 1.4 to 2.0 $\mu$ m.

14. A polymer composition according to any preceding claim, wherein the flash calcined clay is obtained by exposing a particulate hydrous kaolin clay to a temperature of greater than about 500°C for a time not more than 5 seconds.

15. A polymer composition according to any preceding claim, wherein the flash calcined clay is coated with an adherent coupling agent.

16. A polymer composition according to claim 15, wherein the adherent coupling agent is an organosilane coupling agent.

17. A polymer composition according to any preceding claim, wherein the TiO<sub>2</sub> has a median aggregate size in the range of from about 0.2 to 0.35  $\mu$ m.

18. A polymer composition according to any preceding claim, wherein the weight ratio of the flash calcined clay to TiO<sub>2</sub> is in the range of from about 1:100 to about 1:1.

19. A polymer composition according to claim 18, wherein the weight ratio of the flash calcined clay to  $\text{TiO}_2$  is in the range of from about 1:25 to about 1:1.

20. A polymer composition according to claim 18, wherein the weight ratio of the flash calcined clay to  $\text{TiO}_2$  is in the range of from about 1:3 to about 1:1.

21. A polymer composition according to any preceding claim, comprising up to about 80% of the combined weight of the flash calcined clay and titanium dioxide, based on the total weight of the composition.

22. A polymer composition according to claim 21, comprising from about 40 to about 80% of the combined weight of the flash calcined clay and titanium dioxide, based on the total weight of the composition.

23. A polymer composition according to claim 21, comprising up to about 30% of the combined weight flash calcined clay and titanium dioxide, based on the total weight of the composition.

24. A polymer composition according to claim 23, comprising from about 1 to about 10% of the combined weight of the flash calcined clay and titanium dioxide, based on the total weight of the composition.

25. A polymer composition according to any preceding claim, comprising an additional inorganic filler.

26. A polymer composition according to claim 25, wherein the additional inorganic filler is a calcium carbonate.

27. A polymer composition comprising a polyethylene resin, a flash calcined clay and a titanium dioxide, wherein the weight ratio of the flash calcined clay to the titanium dioxide is in the range for from 1:100 to 1:1.

28. A polymer composition according to claim 27, wherein the weight ratio of the flash calcined clay to  $\text{TiO}_2$  is in the range of from about 1:25 to about 1:1.

29. A polymer composition according to claim 28, wherein the weight ratio of the flash calcined clay to  $\text{TiO}_2$  is in the range of from about 1:3 to about 1:1.

30. A polymer composition according to claim 27,  
5 28 or 29, wherein the combined weight of the flash calcined clay and titanium dioxide constitutes up to about 80% of the total weight of the composition.

31. A polymer composition according to claim 30,  
10 wherein the combined weight of the flash calcined clay and titanium dioxide constitutes from about 40 to about 80% of the total weight of the composition.

32. A polymer composition according to claim 30,  
15 wherein the combined weight of flash calcined clay and titanium dioxide constitutes up to about 30% of the total weight of the composition.

33. A polymer composition according to claim 30,  
wherein the combined weight of the flash calcined clay and titanium dioxide constitutes from about 1 to about 10% of the total weight of the composition.

20 34. A polymer composition according to claim 1, or any one of claims 8 to 33 when dependent on claim 1, wherein the polymer resin is selected from nylon 6, nylon 6,6, PET, PVC and polystyrene.

35. A polymer composition according to claim 34,  
25 wherein the polymer resin is a polystyrene resin.

36. A plastic article formed from a polymer composition of any preceding claim.

37. A plastic article according to claim 36 which is a polyolefin film.

30 38. A plastic article according to claim 36 which is a polyethylene film.

39. A plastic article according to claim 36 which is a polystyrene film.

35 40. A production process for preparing the polymer composition of claim 1, wherein the polymer resin, the flash calcined kaolin clay and the titanium

dioxide are combined together to form a homogenous composition.

41. A production process according to claim 40, wherein the flash calcined kaolin clay and the titanium dioxide are mixed with the polymer resin to form a homogenous composition.

42. A production process according to claim 41, wherein separate premixes of (a) the polymer resin and flash calcined clay and (b) the polymer resin and the titanium dioxide are formed, which are then combined, optionally together with additional polymer resin.

43. A polymer composition comprising a polyolefin resin and an opacifying amount of a mixture of titanium dioxide and a flash calcined kaolin clay.

44. A polyolefin film comprising an opacifying amount of a mixture of a flash calcined clay and a  $\text{TiO}_2$ .